UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,205	10/31/2003	Scott J. Smith	5003073-048US1	2786

29737 7590 09/13/2005

SMITH MOORE LLP
P.O. BOX 21927
GREENSBORO, NC 27420

EXAMINER	
SASTRI, SATYA B	
ART UNIT	**PAPER NUMBER**
1713	

DATE MAILED: 09/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,205	SMITH ET AL.	
	Examiner	Art Unit	
	Satya B. Sastri	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/23/04,3/17/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to application filed on October 31, 2003. ***Claims 1-19*** are now pending in the application.

Claim Objections

2. ***Claims 6 and 16*** are objected to because the Markush language is confusing, with the group consisting of the genus polyolefins and further including specific polymers such as polyethylene, polypropylene, LLDPE etc.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. ***Claims 1 and 11*** are rejected under second paragraph of 35 U.S.C. 112 because the weight basis of the composition is not specified. While component (a) is based on the total wt. of polymerizable monomers, it is unclear if the remainder of the monomers are based on the total weight of the superabsorbent composition. The preamble refers to superabsorbent polymer as opposed to superabsorbent polymer composition. In component c), "the particle surface" lacks antecedent basis. Additionally, component h) is vague as recited in terms of the application temperature.

Claim Rejections - 35 U.S.C.103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. ***Claims 1-19*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (EP 0827753 A2) or Johnson et al. (WO 95/11932) or Choi et al. (US 5,032,628) or Sun et al. (US 6,124,391) individually, in view of Nagata et al. (US 5,567,744).

Harada et al. disclose a water absorbent resin based on polymers derived from a variety of monomers such as (meth)acrylic acid and slats thereof, (meth)acrylamide, methoxypolyethylene glycol (meth)acrylate etc. Most advantageously, the absorbent resin comprises (meth)acrylic acid in amounts ranging from 30-90 mole%, neutralized with a basic substance ((page 4, lines 53-59 and page 6, lines 1-16). Additionally, a variety of water soluble cross-linking monomers are disclosed as being useful in amounts ranging from 0.005-1 part by weight, based on 100 parts by weight of the water soluble unsaturated monomer (page 5, 18-45). The disclosure teaches that the water absorbent resin may be treated with surface cross-linking agents to form covalent bonds. Useful surface crosslinking agents may be polyhydric alcohols, polyamines, polyisocyanate compounds etc. (page 12, lines 50-59 and page 13, lines 1-22). The amount of surface crosslinking agent depends on the type used and also on the type of resin, and may be used in amounts ranging from 0.01 to 5 parts by weight, based on 100 parts by weight of

the superabsorbent resin (page 13, lines 22-26). Additionally, the compositions include inorganic powders such as synthetic and natural zeolite, talc, clay, silicon and titanium dioxide etc. to manifest affinity for water and insolubility or spraining solubility in water (page 15, lines 16-27).

Johnson et al. disclose particulate superabsorbent polymeric material which is partially neutralized polymer of an ethylenically unsaturated carboxylic monomer crosslinked with a crosslinking agent (abstract). The polymerization is conducted on partially neutralized acid monomer or fully neutralized monomer. The crosslinker may be used within the conventional range, of 0.05 to 3%. Additionally, surface crosslinking agents may be present in amounts of 0.5 to 5% while finely divided silica may be present as an aqueous slurry containing not more than 10 to 15% of finely divided silica (pages 8-9).

Choi et al. disclose water absorptive resin prepared from neutralized acrylic acid, methacrylic acid and a crosslinking agent and subsequently, surface crosslinked and mixed with a silicate (abstract). Polymerization mixture may comprise 70-90 mole% of neutralized acrylic acid, 10-30 mole% methacrylic acid (column 3, lines 13-35). The working example 1 discloses the internal crosslinked agent with the instant claimed range of 0.001 to 5 % by weight. Additionally, 1.2-8% by weight of surface crosslinking agent may be used to modify the properties (column 4, lines 4-7). Silicate particles are also disclosed in amounts of 0.1-5% by weight of the composition (column 4, lines 37-51).

Sun et al. disclose a particulate material for superabsorbent polymer composition comprising SAP obtained by polymerizing 55 to 99.9% olefinically unsaturated carboxylic acid groups with at least 25 mole% in the neutralized form (column 5, lines 3-19). SAP may further include multifunctional crosslinking agents. Additionally, surface crosslinking agents may be

used in amounts of 0.5% by weight of SAP (column 11, lines 63-65). The compositions may further include fine inorganic powder based on clay in amounts ranging from 0.2-10% by weight of the SAP particles. With regard to the amount of internal crosslinking agent, he working examples use a commercial crosslinked particle of SAP under the trade name AP-88 which is a network of crosslinked of sodium polyacrylate with degree of neutralization of 70 mol% (column 11, lines 45-55).

The difference between the prior art and the instant invention is that the prior art does not disclose the presence of thermoplastic polymer on the superabsorbent particle surface as claimed instantly.

The secondary reference to Nagata et al. disclose high water absorbent resin composition wherein the superabsorbent particles are coated on the surface by thermoplastic resin, in amounts ranging from 1 to 100 parts by weight of the water absorbent resin (abstract). A variety of thermoplastic resins such as ethylene-vinyl acetate, ethylene-acrylic ester copolymers, polyethylene waxes, polypropylene etc. are disclosed as being useful either alone or as a combination (column 3, lines 21-35, column 4, lines 8-26, 38-47). Use of such thermoplastic resins on water absorbent resins have been disclosed to improve the adhesive characteristics of the water absorbent resin (column 1, lines 48-56 and column 11, lines 26-39). In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include appropriate amounts of thermoplastic binder, including the claimed range in the compositions disclosed by Harada et al. or Johnson et al. or Choi et al. or Sun et al. and thereby obtain the instant invention. With regard to the claimed physical properties, it is the examiner's position that the recited prior art combined as whole affords the instantly claimed

composition which must intrinsically possess the clamed physical characteristics as well.

7. ***Claims 1-19*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (EP 0827753 A2) or Johnson et al. (WO 95/11932) or Choi et al. (US 5,032,628) or Sun et al. (US 6,124,391) individually, in view of Engelhardt et al. (US 5,840,321).

Harada et al. disclose a water absorbent resin based on polymers derived from a variety of monomers such as (meth)acrylic acid and slats thereof, (meth)acrylamide, methoxypolyethylene glycol (meth)acrylate etc. Most advantageously, the absorbent resin comprises (meth)acrylic acid in amounts ranging from 30-90 mole%, neutralized with a basic substance ((page 4, lines 53-59 and page 6, lines 1-16). Additionally, a variety of water soluble cross-linking monomers are disclosed as being useful in amounts ranging from 0.005-1 part by weight, based on 100 parts by weight of the water soluble unsaturated monomer (page 5, 18-45). The disclosure teaches that the water absorbent resin may be treated with surface cross-linking agents to form covalent bonds. Useful surface crosslinking agents may be polyhydric alcohols, polyamines, polyisocyanate compounds etc. (page 12, lines 50-59 and page 13, lines 1-22). The amount of surface crosslinking agent depends on the type used and also on the type of resin, and may be used in amounts ranging from 0.01 to 5 parts by weight, based on 100 parts by weight of the superabsorbent resin (page 13, lines 22-26). Additionally, the compositions include inorganic powders such as synthetic and natural zeolite, talc, clay, silicon and titanium dioxide etc. to manifest affinity for water and insolubility or spraining solubility in water (page 15, lines 16-27).

Johnson et al. disclose particulate superabsorbent polymeric material which is partially neutralized polymer of an ethylenically unsaturated carboxylic monomer crosslinked with a

crosslinking agent (abstract). The polymerization is conducted on partially neutralized acid monomer or fully neutralized monomer. The crosslinker may be used within the conventional range, of 0.05 to 3%. Additionally, surface crosslinking agents may be present in amounts of 0.5 to 5% while finely divided silica may be present as an aqueous slurry containing not more than 10 to 15% of finely divided silica (pages 8-9).

Choi et al. disclose water absorptive resin prepared from neutralized acrylic acid, methacrylic acid and a crosslinking agent and subsequently, surface crosslinked and mixed with a silicate (abstract). Polymerization mixture may comprise 70-90 mole% of neutralized acrylic acid, 10-30 mole% methacrylic acid (column 3, lines 13-35). The working example 1 discloses the internal crosslinked agent with the instant claimed range of 0.001 to 5 % by weight. Additionally, 1.2-8% by weight of surface crosslinking agent may be used to modify the properties (column 4, lines 4-7). Silicate particles are also disclosed in amounts of 0.1-5% by weight of the composition (column 4, lines 37-51).

Sun et al. disclose a particulate material for superabsorbent polymer composition comprising SAP obtained by polymerizing 55 to 99.9% olefinically unsaturated carboxylic acid groups with at least 25 mole% in the neutralized form (column 5, lines 3-19). SAP may further include multifunctional crosslinking agents. Additionally, surface crosslinking agents may be used in amounts of 0.5% by weight of SAP (column 11, lines 63-65). The compositions may further include fine inorganic powder based on clay in amounts ranging from 0.2-10% by weight of the SAP particles. With regard to the amount of internal crosslinking agent, he working examples use a commercial crosslinked particle of SAP under the trade name AP-88 which is a

network of crosslinked of sodium polyacrylate with degree of neutralization of 70 mol% (column 11, lines 45-55).

The difference between the prior art and the instant invention is that the prior art does not disclose the presence of thermoplastic polymer on the superabsorbent particle surface as claimed instantly.

The secondary reference to Engelhardt et al. discloses hydrophilic highly water swellable hydrogels which are coated with nonreactive, water insoluble waxes in a quantity of from about 0.05 to 2% by wt., based on the uncoated hydrogel (abstract). Such a coating results in low caking tendency in damp air (column 3, lines 5-11). In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to coat the hydrogel particles in the compositions disclosed by Harada et al. or Johnson et al. or Choi et al. or Sun et al. with hydrophobic waxes as disclosed by Engelhardt et al. and thereby obtain the instant invention. With regard to the claimed physical properties, it is the examiner's position that the recited prior art combined as whole affords the instantly claimed composition which must intrinsically possess the clamed physical characteristics as well.

8. X references to US 2003/065296 A1 to Kaiser et al. teaches or suggest the thermoplastic resin content to be at least 30% by wt. of the composition in contrast to 0.01 to 5 wt.% by wt. of the superabosrbent composition.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satya Sastri at (571) 272 1112.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached at (571) 272 1114.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Satya Sastri

SATYA SASTRI

September 6, 2005

DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700